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(54) Modularized parallel drivetrain

(57) The invention resides in a module used in conjunction with other such modules in an apparatus for rapidly producing an article having a three-dimensional design comprising a base (50), a plurality of translating members (5) mounted on said base and said plurality of translating members movable relative thereto, the base is an interconnectable block of parallel drivetrain elements having a single input shaft (65) and a series of parallel output shafts (45) at right angles to the input shaft whose power flow to the output shafts is connected/disconnected electrically via electromagnetic clutches (55).

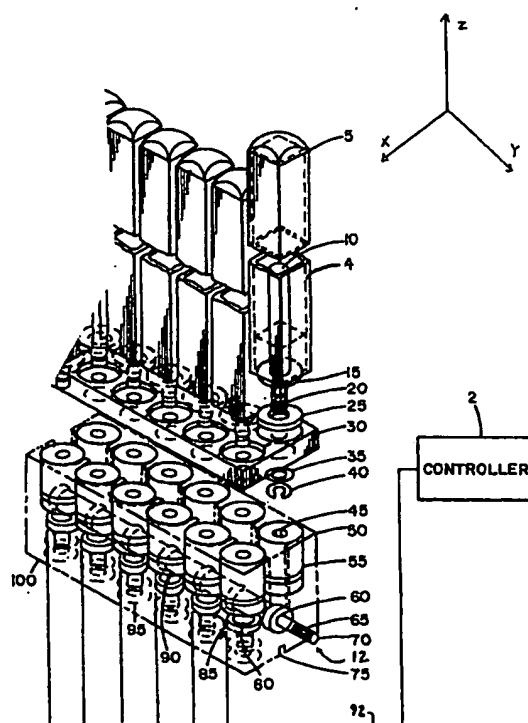


FIG. 1



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EUROPEAN SEARCH REPORT

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A,D	US 5 546 784 A (HAAS EDWIN G ET AL) 20 August 1996 (1996-08-20) * the whole document *	1-10	B23Q1/00 B23Q37/00 B23Q5/00 B21D37/02
A,D	US 5 546 313 A (MASTERS WILLIAM E) 13 August 1996 (1996-08-13) * the whole document *	1-10	B23Q1/26 B23Q1/28 B23Q1/30
A	EP 0 442 036 A (MORITA IRON WORKS) 21 August 1991 (1991-08-21) * the whole document *	1-10	
A	US 114 328 A (GRAFTON T. NUTTER) 2 April 1871 (1871-04-02) * the whole document *	1-10	
A	US 1 141 640 A (P.D.E. HUGUENIN) 1 June 1915 (1915-06-01) * the whole document *	1-10	
A	US 4 212 188 A (PINSON GEORGE T) 15 July 1980 (1980-07-15) * the whole document *	1-10	TECHNICAL FIELDS SEARCHED (Int.Cl.6) B21D B23Q
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 16 September 2002	Examiner Müller, A
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 98 11 5911

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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16-09-2002

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5546784 A	20-08-1996	DE 69523172 D1	15-11-2001
		DE 69523172 T2	06-06-2002
		EP 0796155 A1	24-09-1997
		ES 2161917 T3	16-12-2001
		WO 9617697 A1	13-06-1996
US 5546313 A	13-08-1996	NONE	
EP 0442036 A	21-08-1991	JP 2774976 B2	09-07-1998
		JP 3238127 A	23-10-1991
		AT 116881 T	15-01-1995
		AU 5716690 A	22-08-1991
		CA 2018903 A1	13-08-1991
		DE 69015995 D1	23-02-1995
		DE 69015995 T2	31-08-1995
		EP 0442036 A2	21-08-1991
		ES 2069646 T3	16-05-1995
		KR 169973 B1	18-02-1999
		US 5187969 A	23-02-1993
US 114328 A		NONE	
US 1141640 A		NONE	
US 4212188 A	15-07-1980	NONE	